

## SKIN MAKEUP COMPOSITIONS HAVING OPTIMIZED APPLICATION QUALITIES

### CROSS-REFERENCE TO RELATED APPLICATIONS

[0001] This application claims the benefit of French Application No. 03 06150 filed on May 22, 2003 and U.S. Provisional Application No. 60/506,774 filed on September 30, 2003, the entire disclosures of which are incorporated by reference herein.

### BACKGROUND OF THE INVENTION

[0002] The present invention relates to a skin makeup composition and more particularly a composition of fluid foundation type, having optimized application qualities.

[0003] In general, producing a satisfactory makeup effect on the skin using a foundation involves being able to distribute the foundation uniformly over the entire surface to be made up. To do this, it is necessary for the foundation formulation to have slip qualities that are sufficient to allow good handling, especially for the purpose of covering the entire surface to be made up. These slip qualities make it possible in the end to have a uniform makeup effect, without marks or demarcations.

[0004] The inventors have demonstrated that the presence of an effective amount of polymethyl methacrylate, also known as PMMA, in certain compositions of foundation type are specifically advantageous in this regard.

[0005] Polymethyl methacrylates are generally in the form of hollow white spherical particles generally on the order of a micrometer in size. These particles have the particular feature of having high water or oil adsorption capacity, which is particularly advantageous in cosmetic formulations. Thus, in oil-based cosmetic compositions, by partially adsorbing these oils, the particles give the corresponding composition a dry and powdery feel. Moreover, in formulations of lipstick base type, they allow 10% to 30% of water to be incorporated. These hollow spherical particles of polymethyl methacrylate have thus already been proposed for encapsulation or reservoir purposes, in dry oils, water-based lipsticks and free or compacted powders with a high oil or water content.

### SUMMARY OF THE INVENTION

[0006] The inventors have found, unexpectedly, that the presence of polymethyl methacrylate can improve the properties of cosmetic compositions such as, especially, "fluid" foundations, in terms of application.

[0007] In various exemplary embodiments, the present invention is directed to fluid cosmetic compositions in the form of a water-in-oil emulsion comprising a liquid fatty phase,

an aqueous phase and a dimethicone copolyol, wherein exemplary compositions can comprise solid particles of polymethyl methacrylate and liquid fatty phases can comprise isododecane. In various exemplary embodiments, such compositions are free of cyclotetrasiloxane.

[0008] In various exemplary embodiments, the present invention is directed to fluid cosmetic compositions in the form of water-in-oil emulsions comprising a liquid fatty phase, an aqueous phase, a dimethicone copolyol and a C<sub>8</sub>-C<sub>22</sub> alkyl dimethicone copolyol, wherein exemplary compositions can comprise solid particles of polymethyl methacrylate and liquid fatty phases can comprise volatile hydrocarbon-based oils. In various exemplary embodiments, such compositions are free of cyclotetrasiloxane.

[0009] In various exemplary embodiments, the present invention includes processes for making up skin, including applying at least one composition according to the invention to the skin.

## DETAILED DESCRIPTION OF EXEMPLARY EMBODIMENTS

### Polymethyl methacrylates

[0010] Exemplary polymethyl methacrylates are generally in the form of hollow or solid white spherical particles generally with a micrometer-scale number-average size, in particular ranging from 5 to 20 microns and generally ranging from 7 to 15 microns. The expression "number-average size" refers to the size given by the statistical particle size distribution to half of the population, referred to as D50.

[0011] It is also possible to characterize polymethyl methacrylate particles by their density, which can vary especially as a function of the size of the spherical cavity of a particle.

[0012] Density can be assessed according to the following protocol, referred to as packed density:

[0013] A mass (m) of 40 g of powder is poured into a measuring cylinder; the measuring cylinder is then placed on a Stav 2003 machine from Stampf Volumeter; the measuring cylinder is then subjected to 1500 packing motions; the final volume V<sub>f</sub> of packed powder is then measured directly on the measuring cylinder. Packed density is a ratio m/V<sub>f</sub>, in this instance 40/V<sub>f</sub> (V<sub>f</sub> being expressed in cm<sup>3</sup> and m in g).

[0014] In particular, densities of polymethyl methacrylate particles that may be used according to the invention may range from 0.3 to 0.95, especially from 0.45 to 0.80 and more particularly from 0.5 to 0.75.

**[0015]** According to one particular embodiment of the invention, compositions according to the invention comprise at least two polymethyl methacrylates that differ in density.

**[0016]** According to this variant of the invention, compositions may comprise two types of polymethyl methacrylate particle, having a difference in density of at least 0.12, especially at least 0.15, in particular at least 0.18 and more particularly at least 0.22.

**[0017]** By way of illustration, compositions according to the invention can combine a polymethyl methacrylate of density 0.5 with a second polymethyl methacrylate of density 0.75.

**[0018]** Polymethyl methacrylates of different densities may be combined in weight proportions ranging, respectively, from 40% to 60%, especially from 45% to 55% and in particular from 48% to 52% by weight relative to the total weight of polymethyl methacrylates, or even in a weight ratio of 1.

**[0019]** Without wishing to be bound to any theory, it appears that polymethyl methacrylate powders with a density of greater than 0.5 are more particularly advantageous for prolonging the slip qualities of compositions over time. Polymethyl methacrylate particles with a density of less than or equal to 0.5 appear to be more advantageous in terms of handling of compositions. In other words, foundation can be put on more quickly.

**[0020]** According to one particular variant of the invention, an amount of polymethyl methacrylate of higher density is predominant over an amount of polymethyl methacrylate of lower density.

**[0021]** In particular, polymethyl methacrylate particles of higher density may be solid particles, and polymethyl methacrylate particles of lower density may be hollow particles.

**[0022]** Polymethyl methacrylates according to the invention may be present in compositions in amounts ranging from 1% to 10% by weight, in particular from 2% to 7% and more particularly from 2.5% to 5.5% by weight relative to the total weight of a composition.

**[0023]** As non-limiting illustrations of polymethyl methacrylates that are suitable for the invention, mention may be made especially of polymethyl methacrylate particles sold by the company Wackherr under the name Covabead LH 85 and those sold by the company Nihon Junyaku under the name Jurymer MB1.

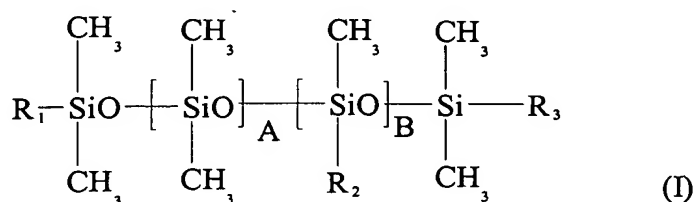
[0024] In the context of the present invention, polymethyl methacrylates are advantageously formulated in a liquid fatty phase comprising at least one volatile oil.

#### Dimethicone copolyol

[0025] Exemplary compositions according to the invention comprise at least one dimethicone copolyol.

[0026] Dimethicone copolyols can include oxypropylenated and/or oxyethylenated polydimethyl methyl siloxanes. Exemplary dimethicone copolyols contain no long-chain alkyl groups of more than 8 carbon atoms, especially C<sub>8</sub>-C<sub>22</sub>.

[0027] Dimethicone copolyols that may be used include those corresponding to formula (I) below:



in which:

[0028] R<sub>1</sub>, R<sub>2</sub> and R<sub>3</sub> independently represent a C<sub>1</sub>-C<sub>6</sub> alkyl radical or a radical - (CH<sub>2</sub>)<sub>x</sub> - (OCH<sub>2</sub>CH<sub>2</sub>)<sub>y</sub> - (OCH<sub>2</sub>CH<sub>2</sub>CH<sub>2</sub>)<sub>z</sub> - OR<sub>4</sub>, at least one radical R<sub>1</sub>, R<sub>2</sub> or R<sub>3</sub> not being an alkyl radical, R<sub>4</sub> being a hydrogen, a C<sub>1</sub>-C<sub>3</sub> alkyl radical or a C<sub>2</sub>-C<sub>4</sub> acyl radical;

[0029] A is an integer ranging from 0 to 200;

[0030] B is an integer ranging from 0 to 50;

[0031] A and B are not simultaneously equal to 0;

[0032] x is an integer ranging from 1 to 6;

[0033] y is an integer ranging from 1 to 30; and

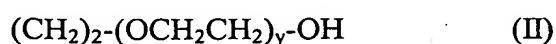
[0034] z is an integer ranging from 0 to 5.

[0035] According to one exemplary embodiment of the invention, in a compound of formula (I), R<sub>1</sub> = R<sub>3</sub> = methyl radical, x is an integer ranging from 2 to 6 and y is an integer ranging from 4 to 30. R<sub>4</sub> is in particular a hydrogen.

[0036] Examples of compounds of formula (I) that may be mentioned include compounds of formula (II):

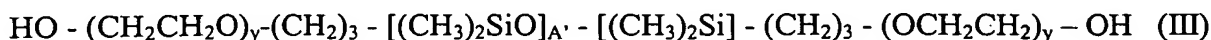


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in which A is an integer ranging from 20 to 105, B is an integer ranging from 2 to 10 and y is an integer ranging from 10 to 20.

[0037] Examples of silicone compounds of formula (I) that may also be mentioned include compounds of formula (III):



[0038] in which A' and y are integers ranging from 10 to 20.

[0039] Dimethicone copolyols that may be used include those sold under the names DC 5329, DC 7439-146, DC 2-5695 and Q4-3667 by the company Dow Corning; KF-6013, KF-6015, KF-6016 and KF-6017 by the company Shin-Etsu.

[0040] DC 5329, DC 7439-146 and DC 2-5695 are compounds of formula (II) in which, respectively, A is 22, B is 2 and y is 12; A is 103, B is 10 and y is 12; A is 27, B is 3 and y is 12.

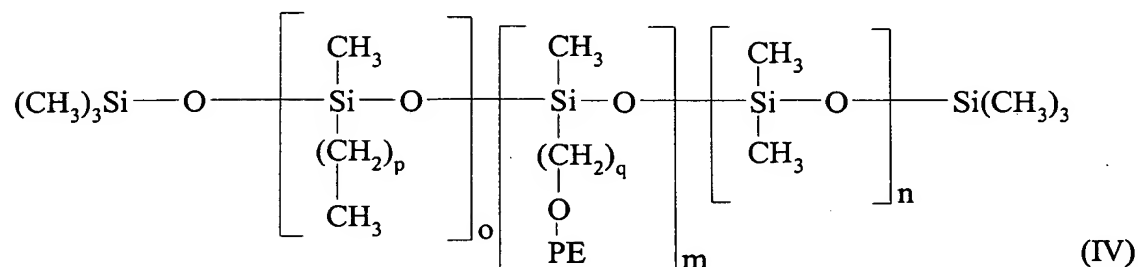
[0041] Dimethicone copolyols may be present in compositions according to the invention in amounts ranging from 5% to 10% by weight, preferably ranging from 5% to 8% by weight and preferentially ranging from 5% to 7% by weight, relative to the total weight of a composition.

#### Alkyl dimethicone copolyol

[0042] According to a second aspect of the invention, exemplary compositions contain at least one C<sub>8</sub>-C<sub>22</sub> alkyl dimethicone copolyol.

[0043] C<sub>8</sub>-C<sub>22</sub> alkyl dimethicone copolyols present in compositions according to the invention may be in particular oxypropylenated and/or oxyethylenated polymethyl (C<sub>8</sub>-C<sub>22</sub>)alkyl dimethyl methyl siloxanes.

[0044] C<sub>8</sub>-C<sub>22</sub> alkyl dimethicone copolyols are advantageously compounds of formula (IV) below:



in which:

[0045] PE represents  $(-C_2H_4O)_x-(C_3H_6O)_y-R$ , R being chosen from a hydrogen atom and an alkyl radical containing from 1 to 4 carbon atoms, x ranging from 0 to 100 and y ranging from 0 to 80, x and y not simultaneously being 0;

[0046] m ranges from 1 to 40;

[0047] n ranges from 10 to 200;

[0048] o ranges from 1 to 100;

[0049] p ranges from 7 to 21; and

[0050] q ranges from 0 to 4,

[0051] and in particular:

[0052]  $R = H$ ;

[0053]  $m = 1$  to 10;

[0054]  $n = 10$  to 100;

[0055]  $o = 1$  to 30;

[0056]  $p = 15$ ; and

[0057]  $q = 3$ .

[0058]  $C_8$ - $C_{22}$  alkyl dimethicone copolyols that may be mentioned include cetyl dimethicone copolyol, for instance the product sold under the name Abil EM-90 by the company Goldschmidt.

[0059]  $C_8$ - $C_{22}$  alkyl dimethicone copolyols may be present in compositions according to the invention in amounts ranging from 0.5% to 2% by weight and in particular ranging from 0.5% to 1.5% by weight relative to the total weight of a composition.

#### Fatty phase

[0060] The term "liquid fatty phase" refers to any non-aqueous medium that is liquid at room temperature (25°C) and atmospheric pressure (760 mmHg), composed of one or more fatty substances that are liquid at room temperature. Liquid fatty phases may contain a volatile liquid organic phase and/or a non-volatile liquid organic phase.

[0061] The term "volatile organic phase" refers to any non-aqueous medium capable of evaporating from skin in less than one hour at room temperature and atmospheric pressure. Volatile phases can especially comprise oils with a vapour pressure, at room temperature (25°C) and atmospheric pressure (760 mmHg), ranging from 0.13 Pa to 40 000 Pa ( $10^{-3}$  to 300 mmHg), especially ranging from 1.3 Pa to 13 000 Pa (0.01 to 100 mmHg) and in particular ranging from 1.3 Pa to 1300 Pa (0.01 to 10 mmHg).

[0062] In addition, volatile oils generally have a boiling point, measured at atmospheric pressure, ranging from 150°C to 260°C and especially ranging from 170°C to 250°C.

[0063] Advantageously, volatile organic phases contain one or more volatile organic oils with a flash point ranging from 30°C to 102°C, in particular from 40°C to 55°C and especially from 40°C to 50°C, and mixtures thereof.

[0064] The term “non-volatile organic phase” refers to any medium capable of remaining on skin for several hours. Non-volatile liquid organic phases in particular can have a non-zero vapour pressure at room temperature and atmospheric pressure, of less than 0.001 mmHg (0.13 Pa).

[0065] Liquid fatty phases of emulsions according to the invention can contain at least one volatile hydrocarbon-based oil, which, according to a first aspect of the invention, is at least isododecane.

[0066] The term “hydrocarbon-based oil” refers to an oil formed essentially from, or even consisting of, carbon and hydrogen atoms, and possibly oxygen and nitrogen atoms, and containing no silicon or fluorine atoms. Hydrocarbon-based oils may contain alcohol, ester, ether, carboxylic acid, amine and/or amide groups.

[0067] As volatile oils that may be used in exemplary embodiments of the invention, mention may be made of linear or branched hydrocarbon-based volatile oils containing from 8 to 16 carbon atoms, and mixtures thereof, and especially branched C<sub>8</sub>-C<sub>16</sub> alkanes, for instance C<sub>8</sub>-C<sub>16</sub> isoalkanes (also known as isoparaffins), isododecane, isohexadecane, for example the oils sold under the trade names Isopar® or Permethyl®, and branched C<sub>8</sub>-C<sub>16</sub> esters, for instance isohexyl neopentanoate, and mixtures thereof. Isododecane can be used in particular.

[0068] Volatile hydrocarbon-based oils, and especially isododecane, may be present in amounts ranging from 5% to 25% by weight, especially ranging from 10% to 20% by weight and in particular ranging from 10% to 15% by weight, relative to the total weight of a composition.

[0069] Emulsions according to the invention may comprise additional volatile oils, which may be chosen from hydrocarbon-based volatile oils. In exemplary embodiments, additional oils other than isododecane can be used in compositions comprising isododecane. For example, volatile silicone oils optionally comprising alkyl or alkoxy groups that are pendent or at the end of a silicone chain, volatile fluoro oils and mixtures thereof can be used.

[0070] As volatile silicone oils that may be used in exemplary embodiments of the invention, mention may be made of linear, branched or cyclic silicone oils with a viscosity at room temperature of less than  $8 \text{ mm}^2/\text{s}$  and especially containing from 2 to 7 silicon atoms, these silicones optionally comprising alkyl or alkoxy groups containing from 1 to 10 carbon atoms that are pendent or at the end of each silicone. As volatile silicone oils that may be used in exemplary embodiments of the invention, mention may especially be made of octamethylcyclotetrasiloxane, decamethylcyclopentasiloxane, dodecamethylcyclohexasiloxane, heptamethylhexyltrisiloxane, heptamethyloctyltrisiloxane, hexamethyldisiloxane, octamethyltrisiloxane, decamethyltetrasiloxane and dodecamethylpentasiloxane, and mixtures thereof. On the other hand, silicone oils such as cyclotetrasiloxane are not desired, especially in view of their lack of harmlessness.

[0071] Volatile fluoro oils generally do not have a flash point.

[0072] Volatile fluoro oils that may be mentioned include nonafluoroethoxybutane, nonafluoromethoxybutane, decafluoropentane, tetradecafluorohexane and dodecafluoropentane, and mixtures thereof.

[0073] Advantageously, additional volatile oils represent from 20% to 32% by weight, especially from 20% to 30% by weight and in particular from 22% to 26% by weight, relative to the total weight of a composition.

[0074] Exemplary compositions may also comprise at least one non-volatile oil.

[0075] As non-volatile oils that may be used in exemplary embodiments of the invention, mention may be made of hydrocarbon-based oils of mineral or synthetic origin, such as linear or branched hydrocarbons, for instance liquid paraffin or derivatives thereof, liquid petroleum jelly, polydecenes, hydrogenated polyisobutene such as Parleam sold by the company Nippon Oil Fats, and squalane of synthetic or plant origin; oils of animal origin, for instance mink oil, turtle oil or perhydrosqualene; hydrocarbon-based oils of plant origin with a high triglyceride content consisting of fatty acid esters of glycerol, the fatty acids of which may have varying chain lengths, these chains possibly being linear or branched, and saturated or unsaturated, especially fatty acid triglycerides especially of 4 to 22 carbon atoms, for instance heptanoic or octanoic acid triglyceride, and capric/caprylic acid triglyceride, or alternatively hydroxylated triglycerides, such as sweet almond oil, beauty-leaf oil, palm oil, grapeseed oil, sesame oil, arara oil, rapeseed oil, sunflower oil, cotton oil, apricot oil, castor oil, alfalfa oil, marrow oil, blackcurrant oil, macadamia oil, musk rose oil, hazelnut oil, avocado oil, jojoba oil, olive oil, cereal (maize, wheat, barley or rye) germ oil, or shea butter;



fatty acid esters, in particular of 4 to 22 carbon atoms, and especially of octanoic acid, of heptanoic acid, of lanolic acid, of oleic acid, of lauric acid or of stearic acid, for instance propylene glycol dioctanoate, propylene glycol monoisostearate, polyglyceryl-2 diisostearate or neopentyl glycol diheptanoate; synthetic esters of formula  $R_1COOR_2$  in which  $R_1$  represents a linear or branched higher fatty acid residue containing from 7 to 40 carbon atoms and  $R_2$  represents a branched hydrocarbon-based chain containing from 3 to 40 carbon atoms, for instance purcellin oil (cetostearyl octanoate), isononyl isononanoate,  $C_{12}$  to  $C_{15}$  alkyl benzoate, 2-ethylhexyl palmitate, 2-octyldodecyl stearate, 2-octyldodecyl erucate, isostearyl isostearate, 2-octyldodecyl benzoate, alcohol or polyalcohol octanoates, decanoates or ricinoleates, isopropyl myristate, isopropyl palmitate, butyl stearate, hexyl laurate, diisopropyl adipate, 2-ethylhexyl palmitate, 2-hexyldecyl laurate, 2-octyldecyl palmitate, 2-octyldodecyl myristate, 2-diethylhexyl succinate, diisostearyl malate or glyceryl triisostearate or diglyceryl triisostearate; hydroxylated esters, for instance isostearyl lactate, octyl hydroxystearate, octyldodecyl hydroxystearate, diisostearyl malate, triisocetyl citrate; diethylene glycol diisononanoate; pentaerythritol esters; esters of aromatic acids and of alcohols containing 4 to 22 carbon atoms, especially tridecyl trimellitate;  $C_8$ - $C_{26}$  higher fatty acids such as oleic acid, linoleic acid, linolenic acid or isostearic acid;  $C_8$ - $C_{26}$  higher fatty alcohols such as oleyl alcohol, linoleyl alcohol, linolenyl alcohol, isostearyl alcohol or octyldodecanol; synthetic ethers containing at least 7 carbon atoms, silicone oils such as polydimethylsiloxanes (PDMS) that are liquid at room temperature, linear, and optionally phenylated, such as phenyltrimethicones, phenyltrimethylsiloxydiphenylsiloxanes, diphenyl dimethicones, diphenylmethyldiphenyltrisiloxanes, liquid 2-phenylethyl trimethylsiloxysilicates, optionally substituted with aliphatic and/or aromatic groups, for instance alkyl, alkoxy or phenyl groups, which are pendent and/or at the end of a silicone chain, these groups containing from 2 to 24 carbon atoms and being optionally fluorinated, or with functional groups such as hydroxyl, thiol and/or amine groups; polysiloxanes modified with fatty acids, fatty alcohols or polyoxyalkylenes, for instance dimethicone copolyols or alkylmethicone copolyols; liquid fluorosilicones; or caprylic/capric acid triglycerides, for instance those sold by the company Stearineries Dubois or those sold under the names Miglyol 810, 812 and 818 by the company Dynamit Nobel; and mixtures thereof.

**[0076]** Exemplary compositions may comprise one or more non-volatile oils in a content ranging from 0.1% to 12% by weight and especially from 1% to 5% by weight relative to the total weight of a composition.

[0077] Compositions according to exemplary embodiments of the invention may also comprise at least one wax, at least one gum and/or at least one pasty fatty substance, which is silicone-based or non-silicone-based, of plant, animal, mineral or synthetic origin.

[0078] As used herein, the term “wax” refers to lipophilic fatty compounds that are solid at room temperature (25°C), with a reversible solid/liquid change of state, having a melting point of greater than 30°C which may be up to 200°C, a hardness of greater than 0.5 MPa, and having an anisotropic crystal organization in the solid state. By bringing waxes to their melting points, it is possible to make them miscible with oils and to form microscopically homogeneous mixtures, but on returning the temperature of such mixtures to room temperature, recrystallization of waxes in the oils of the mixture is obtained.

[0079] As used herein, waxes may be hydrocarbon-based waxes, silicone waxes and/or fluoro waxes, optionally comprising ester or hydroxyl functions. Exemplary waxes especially include waxes of natural origin, for instance optionally modified beeswax, carnauba wax, candelilla wax, ouricury wax, Japan wax, cork fibre wax or sugarcane wax, ceresin, paraffin wax, lignite wax, microcrystalline waxes, lanolin wax, montan wax, ozokerites, hydrogenated oils, for instance hydrogenated jojoba oil or waxes obtained from the copolymerization of ethylene, waxes obtained by Fischer-Tropsch synthesis, fatty acid esters and glycerides that are solid at 45°C, silicone waxes, for instance alkyl, alkoxy and/or esters of poly(di)methylsiloxane that are solid at 45°C, containing from 10 to 45 carbon atoms, and certain fatty acids, for instance stearic acid, myristic acid or behenic acid, and mixtures thereof.

[0080] Waxes may represent from 0.01% to 10% by weight and especially from 0.1% to 5% by weight relative to the total weight of a composition. According to one embodiment, compositions may be free of waxes.

[0081] As used herein, the term “pasty compound” refers to a compound with a melting point ranging from 25°C to 60°C and preferably from 30°C to 45°C, and having a hardness ranging from 0.001 to 0.5 MPa and preferably from 0.005 to 0.4 MPa.

[0082] Examples of pasty fatty substances that may be mentioned include PDMSs with pendent chains of the alkyl or alkoxy type containing from 8 to 24 carbon atoms, for instance stearyl dimethicone, and especially those sold by Dow Corning under the references DC2503 or DC05514; esters of fatty alcohol or of fatty acid containing from 20 to 25 carbon atoms (a melting point especially from 20°C to 35°C and/or a viscosity at 40°C ranging from 0.1 to 40 Pa.s), for instance cholesterol esters such as hydrogenated triglycerides of plant

origin, for instance the hydrogenated castor oil sold under the name “Thixinr” by the company Rheox, polyvinyl laurate, arachidyl propionate, triisostearyl or cetyl citrate, PVP/eicosene copolymer; isopropyl lanolins with a viscosity from 10 to 25 Pa.s and preferably from 19 to 25 Pa.s and/or a melting point of 25°C to 45°C, and mixtures thereof.

[0083] Exemplary compositions of the invention may also comprise at least one alkyl, alkoxy or phenyl dimethicone, for instance the product sold under the name “Abil wax 2440®” by the company Goldschmidt.

#### Aqueous phase

[0084] Exemplary compositions according to the invention can comprise at least one aqueous phase containing water. Water may be floral water such as cornflower water and/or mineral water such as Vittel water, Lucas water or La Roche Posay water and/or spring water.

[0085] Aqueous phases may also comprise organic solvents that are miscible with water (at 25°C), for instance the primary alcohols such as ethanol and isopropanol, glycols such as glycerol, propylene glycol, butylene glycol, dipropylene glycol, diethylene glycol, glycol ethers, such as C<sub>1</sub>-C<sub>4</sub> alkyl ethers of mono-, di- or tripropylene glycol, or mono-, di- or triethylene glycol, and mixtures thereof.

[0086] Aqueous phases may also comprise stabilizers, for example sodium chloride, magnesium dichloride and magnesium sulphate.

[0087] Aqueous phases may also comprise any water-soluble or water-dispersible compound that is compatible with an aqueous phase, such as gelling agents, film-forming polymers, thickeners and surfactants, and mixtures thereof.

[0088] According to one exemplary embodiment, aqueous phases, and especially water, may be present in compositions according to the invention in amounts ranging from 30% to 50% by weight and especially from 35% to 45% by weight relative to the total weight of a composition.

#### Thickener

[0089] Emulsions according to exemplary embodiments of the invention may also comprise a fatty-phase thickener. Exemplary thickeners may be chosen from:

[0090] organomodified clays, which are clays treated with compounds chosen especially from quaternary amines and tertiary amines. Organomodified clays that may be mentioned include organomodified bentonites, such as those sold under the name “Bentone

34” by the company Rheox and organomodified hectorites such as those sold under the names “Bentone 27” and “Bentone 38” by the company Rheox;

[0091] hydrophobic fumed silica, which is a fumed silica chemically surface-modified by chemical reaction generating a decrease in the number of silanol groups. It is especially possible to substitute silanol groups with hydrophobic groups.

[0092] Hydrophobic groups can include:

[0093] trimethylsiloxy groups, which are obtained especially by treating fumed silica in the presence of hexamethyldisilazane. Silicas thus treated are known as “silica silylate” according to the CTFA (6th edition, 1995). They are sold, for example, under the references “Aerosil R812<sup>®</sup>” by the company Degussa and “Cab-O-Sil TS-530<sup>®</sup>” by the company Cabot;

[0094] dimethylsilyloxy or polydimethylsiloxane groups, which are obtained especially by treating fumed silica in the presence of polydimethylsiloxane or dimethyldichlorosilane. Silicas thus treated are known as “silica dimethyl silylate” according to the CTFA (6th edition, 1995). They are sold, for example, under the references “Aerosil R972<sup>®</sup>” and “Aerosil R974<sup>®</sup>” by the company Degussa and “Cab-O-Sil TS-610<sup>®</sup>” and “Cab-O-Sil TS-720<sup>®</sup>” by the company Cabot.

[0095] Fumed silica preferably has a particle size that may be nanometric to micrometric, for example ranging from about 5 to 200 nm.

[0096] Fatty-phase thickeners may be present in a content ranging from 0.1% to 5% by weight and especially from 0.4% to 3% by weight relative to the total weight of a composition.

#### Fillers

[0097] Exemplary compositions according to the invention may also comprise at least one additional filler other than the polymethyl methacrylate powders.

[0098] The term “filler” refers to any colorless particle chosen from mineral or organic, lamellar, spherical or oblong fillers, which is chemically inert in a composition.

[0099] Mention may be made of talc, mica, silica, kaolin, polyamide powders, for instance Nylon<sup>®</sup> powder, poly-β-alanine powder and polyethylene powder, powders of tetrafluoroethylene polymers (Teflon<sup>®</sup>), lauroyllysine, starch, boron nitride, hollow polymer microspheres such as those of polyvinylidene chloride/acrylonitrile, such as Expancel<sup>®</sup> (Nobel Industrie), acrylic polymer particles, especially of acrylic acid copolymer, for instance Polytrap<sup>®</sup> (Dow Corning), polyurethane powders, silicone resin microbeads (for example

Tospearls® from Toshiba), precipitated calcium carbonate, dicalcium phosphate, magnesium carbonate and magnesium hydrocarbonate, hydroxyapatite, hollow silica microspheres (Silica Beads® from Maprecos), glass or ceramic microcapsules, metal soaps derived from organic carboxylic acids containing from 8 to 22 carbon atoms and preferably from 12 to 18 carbon atoms, for example zinc stearate, magnesium stearate or lithium stearate, zinc laurate and magnesium myristate, and mixtures thereof. These fillers may or may not be surface-treated, especially to make them lipophilic.

[0100] Fillers may be present in compositions according to the invention in amounts ranging from 0.1% to 10% by weight and especially from 0.1% to 7% by weight relative to the total weight of a composition.

#### Dyestuffs

[0101] In exemplary embodiments, compositions may advantageously contain at least one dyestuff, which may be chosen from the lipophilic dyes, hydrophilic dyes, pigments and nacles usually used in cosmetic or dermatological compositions, and mixtures thereof. Dyestuffs are generally present in a proportion of from 0.01% to 40% by weight, especially from 1% to 35% by weight, in particular from 2% to 25% by weight and more particularly from 3% to 20% by weight relative to the total weight of a composition.

[0102] Liposoluble dyes include, for example, Sudan Red, DC Red 17, DC Green 6,  $\beta$ -carotene, soybean oil, Sudan Brown, DC Yellow 11, DC Violet 2, DC Orange 5 and quinoline yellow. They may represent from 0.1% to 20% by weight and in particular from 0.1% to 6% by weight relative to the total weight of a composition.

[0103] Pigments may be white or colored, mineral and/or organic, and coated or uncoated. Mineral pigments that may be mentioned include titanium dioxide, optionally surface-treated, zirconium oxide or cerium oxide, and also iron oxide or chromium oxide, manganese violet, ultramarine blue, chromium hydrate and ferric blue. Organic pigments that may be mentioned include carbon black, pigments of D&C type, and lakes based on cochineal carmine, barium, strontium, calcium or aluminium. Pigments may represent from 0.1% to 40% by weight, especially from 1% to 35% by weight and in particular from 2% to 25% by weight relative to the total weight of a composition.

[0104] Nacreous pigments may be chosen from white nacreous pigments such as mica coated with titanium or with bismuth oxychloride, colored nacreous pigments such as titanium mica with iron oxides, titanium mica especially with ferric blue or with chromium oxide, titanium mica with an organic pigment of the above mentioned type and also nacreous

pigments based on bismuth oxychloride. Nacreous pigments may represent from 0.1% to 20% by weight and in particular from 0.1% to 15% by weight relative to the total weight of a composition.

[0105] Advantageously, emulsions according to exemplary embodiments of the invention comprise hydrophobic-coated pigments. Hydrophobic-coated pigments are pigments (such as those mentioned above) that are surface-treated with a hydrophobic agent to make them compatible with a fatty phase of the emulsion, especially so that they have good wettability with the oils of a fatty phase, such that these treated pigments are satisfactorily dispersed in a fatty phase.

[0106] Hydrophobic treatment agents may be chosen from silicones, for instance methicones, dimethicones or perfluoroalkylsilanes; fatty acids, for instance stearic acid; metal soaps, for instance aluminium dimyristate, the aluminium salt of hydrogenated tallow glutamate, perfluoroalkyl phosphates, perfluoroalkylsilanes, perfluoroalkylsilazanes, polyhexafluoropropylene oxides, polyorganosiloxanes comprising perfluoroalkyl perfluoropolyether groups, and amino acids; N-acylamino acids or salts thereof; lecithin, isopropyl triisostearyl titanate, and mixtures thereof.

[0107] N-acylamino acids may comprise an acyl group containing from 8 to 22 carbon atoms, for instance a 2-ethylhexanoyl, caproyl, lauroyl, myristoyl, palmitoyl, stearyl or cocoyl group. Salts of these compounds may be the aluminium, magnesium, calcium, zirconium, zinc, sodium or potassium salts. Amino acids may be, for example, lysine, glutamic acid or alanine.

[0108] The term "alkyl" mentioned with respect to hydrophobic agents mentioned above especially denotes an alkyl group containing from 1 to 30 carbon atoms and preferably containing from 5 to 16 carbon atoms.

[0109] Hydrophobic-treated pigments are especially described in patent application EP-A-1 086 683.

### Rheology

[0110] Advantageously, exemplary compositions according to the invention may have a viscosity, measured at 25°C, at a shear rate of 200 min<sup>-1</sup> (200 rpm, i.e. a frequency of 50 Hz), ranging from 0.15 to 0.6 Pa.s (1.5 to 6 poises) and especially ranging from 0.25 to 0.45 Pa.s (2.5 to 4.5 poises). Such viscosities allow easy application of emulsions and allow a homogeneous, uniform, mark-free makeup effect to be obtained. Viscosity can be measured at 25°C using a Contraves TV viscometer equipped with a No. 2 spindle, the measurement

being performed after spinning the spindle for 10 minutes (after which time stabilization of the viscosity and of the spin speed of the spindle are observed), at a shear rate of  $200 \text{ min}^{-1}$ .

### Additives

[0111] Exemplary compositions of the invention may also comprise any additional additive usually used in the field under consideration, such as antioxidants, preserving agents, neutralizers, lipophilic gelling agents, aqueous-phase gelling agents, dispersants, cosmetic active agents, fragrances, free-radical scavengers, sequestering agents and film-forming agents, and mixtures thereof. These additives may be present in compositions in a proportion of from 0.0005% to 20% by weight and in particular from 0.001% to 10% by weight relative to the total weight of a composition.

[0112] As cosmetic active agents that may be used in the invention, mention may be made of vitamins A, E, C, B<sub>3</sub> and F, provitamins, for instance D-panthenol, calmatives, for instance  $\alpha$ -bisabolol, aloe vera and allantoin, plant extracts or essential oils, protective or restructuring agents, for instance ceramides, "refreshing" active agents, for instance menthol and its derivatives, emollients, moisturizers, anti-wrinkle active agents, essential fatty acids and sunscreens, and mixtures thereof.

[0113] Needless to say, a person skilled in the art will take care to select optional additional additives and/or amounts thereof such that advantageous properties of compositions according to the invention are not, or are not substantially, adversely affected by the envisaged addition.

[0114] Exemplary compositions according to the invention may be manufactured by the known processes generally used in cosmetics.

[0115] Compositions according to the invention may be skin makeup compositions, for instance a foundation, a concealer product, a tinted cream, a body makeup composition, and in particular a foundation to be applied to the face and/or the neck.

[0116] This invention is illustrated by the following examples, which are merely for the purpose of illustration.

### Examples

#### Example 1

<u>Foundation formulation</u>	<u>% by weight</u>
[0117] 1,3-butylene glycol	10.00
[0118] hectorite modified with distearyltrimethylammonium chloride (sold under the name Bentone 38 V by Elementis)	1.60

[0119]	preserving agents	0.90
[0120]	water	qs 100.00
[0121]	cyclopentadimethylsiloxane	11.36
[0122]	isostearyl neopentanoate	0.50
[0123]	sodium chloride	0.70
[0124]	isododecane	13.00
[0125]	cyclohexadimethylsiloxane	8.00
[0126]	polydimethylsiloxane (DC 200 fluid 5 cSt sold by Dow Corning)	2.00
[0127]	cetyl dimethicone copolyol (sold under the name Abil EM90 by Goldschmidt)	0.80
[0128]	polyglyceryl isostearate	0.60
[0129]	isoeicosane	2.00
[0130]	hexyl laurate	0.60
[0131]	hollow polymethyl methacrylate microspheres (sold under the name Covabead LH85 by Wackherr)	2.00
[0132]	polymethyl methacrylate powder (sold under the name Jurymer MB1 by Nihon Junyaku)	2.00
[0133]	oxyethylenated polydimethylsiloxane (sold under the name KF-6017 from Shin-Etsu)	4.48
[0134]	nacre 1.00	
[0135]	yellow iron oxide coated with perfluoroalkyl phosphate, as a dispersion in decamethylcyclopentasiloxane/dimethicone copolyol (sold under the name FA50DYF by Kobo)	2.40
[0136]	brown iron oxide coated with perfluoroalkyl phosphate, as a dispersion in cyclomethicone/dimethyl polysiloxane copolyol (sold under the name FA50DRF by Kobo)	0.93
[0137]	black iron oxide coated with perfluoroalkyl phosphate, as a dispersion in decamethylcyclopentasiloxane/dimethicone copolyol (sold under the name FA65DBF by Kobo)	0.44
[0138]	alumina-treated titanium oxide coated with perfluoroalkyl phosphate, in decamethylcyclopentasiloxane/dimethicone copolyol (sold under the name FA65DF by Kobo)	9.54



**[0139]** This foundation applies easily to the skin, is found to have advantageous slip qualities on the skin, and can be worked easily so as to distribute the makeup uniformly on the face.

**[0140]** While this invention has been described in conjunction with the exemplary embodiments and examples outlined above, various alternatives, modifications, variations, improvements and/or substantial equivalents, whether known or that are or may be presently unforeseen, may become apparent to those having at least ordinary skill in the art. Accordingly, the exemplary embodiments of the invention, as set forth above, are intended to be illustrative, not limiting. Various changes may be made without departing from the spirit and scope of the invention. Therefore, the invention is intended to embrace all known or later developed alternatives, modifications, variations, improvements and/or substantial equivalents.